

AMENDMENTS TO THE CLAIMS

Listing of claims:

This listing of claims replaces all prior versions and listings of claims in the application.

1. (Currently Amended): A cleaning agent for a substrate consisting essentially of comprising [I] an organic acid having at least one carboxyl group, [II] a complexing agent, [[and]] [III] at least one 0.05 to 40% by weight of an organic solvent selected from the group consisting of (1) monohydric alcohols, (2) alkoxyalcohols, (3) glycols, (4) glycol ethers, (5) ketones and (6) nitriles, and [IV] water;

wherein the total concentration of organic solvent(s) in the cleaning agent is 0.05 to 40% by weight; and wherein pH of the cleaning agent is 0.5 to 6.5.

2. (Cancelled).

3. (Original): The cleaning agent according to Claim 1, wherein the cleaning agent is an aqueous solution.

4. (Original): The cleaning agent according to Claim 1, wherein the organic solvent is one selected from the group consisting of methanol, ethanol, isopropyl alcohol, 2-methoxyethanol, 2-(2-butoxyethoxy)ethanol, ethylene glycol, diethylene glycol monomethyl ether, acetone and acetonitrile.

5. (Original): The cleaning agent according to Claim 1, wherein the complexing agent is one selected from the group consisting of a compound having at least one phosphonic acid group in a molecule, and an ammonium salt or an alkali metal salt thereof.

6. (Original): The cleaning agent according to Claim 5, wherein the compound having at least one phosphonic acid group in a molecule is one selected from the group consisting of nitrogen-containing polyphosphonic acids having 1 to 6 nitrogen atoms and 1 to 8 phosphonic acid groups in a molecule, an aryl polyphosphonic acid, an alkylene polyphosphonic acid, alkane polyphosphonic acids which may have a hydroxyl group, and an ammonium salt or an alkali metal salt thereof.

7. (Original): The cleaning agent according to Claim 5, wherein the compound having at least one phosphonic acid group in a molecule is one selected from the group consisting of nitrogen-containing polyphosphonic acids having 1 to 6 nitrogen atoms and 1 to 8 phosphonic acid groups in a molecule, alkane polyphosphonic acids which may have a hydroxyl group, and an ammonium salt or an alkali metal salt thereof.

8. (Original): The cleaning agent according to Claim 6, wherein the nitrogen-containing polyphosphonic acids having 1 to 6 nitrogen atoms and 1 to 8 phosphonic acid groups in a molecule is one selected from the group consisting of an alkylamino poly(alkylphosphonic acid),

a mono- or polyalkylenepolyamine poly(alkylphosphonic acid), a nitrilo-poly(alkylphosphonic acid), and an ammonium salt or an alkali metal salt thereof.

9. (Original): The cleaning agent according to claim 1, wherein the complexing agent is one selected from the group consisting of:

ethylenediaminebis(methylenephosphonic acid) [EDDPO];

ethylenediaminetetrakis(ethylenephosphonic acid);

ethylenediaminetetrakis(methylenephosphonic acid) [EDTPO];

hexamethylenediaminetetrakis(methylenephosphonic acid);

isopropylenediaminebis(methylenephosphonic acid);

isopropylenediamintetra(methylenephosphonic acid);

propanediaminetetra(ethylenephosphonic acid)[PDTMP];

diaminopropanetetra(methylenephosphonic acid)[PDTPO];

diethylenetriaminepenta(ethylenephosphonic acid)[DEPPO];

diethylenetriaminepenta(methylenephosphonic acid)[DETPO];

triethylenetetraminehexa(ethylenephosphonic acid)[TETHP];

triethylenetetraminehexa(methylenephosphonic acid)[TTHPO];

nitrilotris(methylenephosphonic acid)[NTPO];

ethylenediphosphonic acid;

1-hydroxyethylidene-1,1'-diphosphonic acid [HEDPO];

1-hydroxypropylidene-1,1'-diphosphonic acid; and

1-hydroxybutylidene-1,1'-diphosphonic acid.

10. (Original): The cleaning agent according to Claim 1, wherein the organic acid is an organic acid having 2 or 3 carboxyl groups.

11. (Original): The cleaning agent according to Claim 1, wherein the organic acid is a dicarboxylic acid or an oxycarboxylic acid.

12. (Original): The cleaning agent according to Claim 11, wherein the oxycarboxylic acid is an oxydicarboxylic acid or an oxytricarboxylic acid.

13. (Original): The cleaning agent according to Claim 11, wherein the dicarboxylic acid is one selected from the group consisting of an oxalic acid, a malonic acid, a succinic acid, a glutaric acid, an adipic acid, a pimelic acid, a maleic acid, a fumaric acid and a phthalic acid.

14. (Original): The cleaning agent according to Claim 11, wherein the oxycarboxylic acid is a malic acid, a tartaric acid, or a citric acid.

15. (Original): The cleaning agent according to Claim 1, wherein the organic acid is a dicarboxylic acid or an oxycarboxylic acid; the complexing agent is one selected from the group consisting of nitrogen-containing polyphosphonic acid having 1 to 6 nitrogen atoms and 1 to 8

phosphonic acid groups in a molecule, alkane polyphosphonic acids which may have a hydroxyl group, and an ammonium salt or an alkali metal salt thereof; and the organic solvent is one selected from the group consisting of monohydric alcohols, alkoxyalcohols, glycols, glycol ethers, ketones and nitriles.

16. (Cancelled).

17. (Original): The cleaning agent according to Claim 1, wherein the substrate is a semiconductor.

18. (Original): The cleaning agent according to Claim 1, wherein the substrate is one with metallic wiring provided thereon.

19. (Original): The cleaning agent according to Claim 18, wherein the metallic wiring is a copper wiring.

20. (Original): The cleaning agent according to Claim 1, wherein the substrate is one treated with a slurry containing benzotriazole or a derivative thereof.

21. (Withdrawn): A cleaning method for a surface of substrate, which comprises treating the surface of substrate with the cleaning agent according to Claim 1.

22. (Withdrawn): The cleaning method according to Claim 21, wherein the treatment with the cleaning agent is dipping the surface of substrate in the cleaning agent according to Claim 1 or spraying said cleaning agent on the surface of substrate.

23. (Withdrawn): The cleaning method according to Claim 21, wherein physical cleaning is further used in combination.

24. (Withdrawn): The cleaning method according to Claim 21, wherein the substrate is one after subjecting to a chemical mechanical polishing process.

25. (Withdrawn): The cleaning method according to Claim 21, wherein the substrate is a semiconductor.

26. (Withdrawn): The cleaning method according to Claim 21, wherein the substrate is one with metallic wiring provided thereon.

27. (Withdrawn): The cleaning method according to Claim 26, wherein the metallic wiring is a copper wiring.

28. (Withdrawn): The cleaning method according to Claim 21, wherein the substrate is one after subjecting to the treatment process with a slurry containing benzotriazole or a derivative thereof.

29. (Currently Amended) The cleaning agent according to claim 1, wherein the total concentration ~~content~~ of the organic acid in the cleaning agent for a substrate is 0.05 to 50% by weight, and the total concentration ~~content~~ of the complexing agent in the cleaning agent for a substrate is 0.01 to 30% by weight.

30. (New) A cleaning agent for a substrate consisting essentially of [I] an organic acid having at least one carboxyl group, [II] a complexing agent, and [III] at least one organic solvent selected from the group consisting of (1) monohydric alcohols, (2) alkoxyalcohols, (3) glycols, (4) glycol ethers, (5) ketones and (6) nitriles, [IV] water and [V] at least one component selected from the group consisting of a reducing agent, a metal corrosion inhibitor and a surfactant;

wherein the total concentration of the organic solvent(s) in the cleaning agent is 0.05 to 40% by weight; and pH of the cleaning agent is 0.5 to 6.5.

31. (New) The cleaning agent according to Claim 30, wherein the reducing agent is one selected from the group consisting of hydrazine or derivatives thereof, ascorbic acid and formalin.

32. (New) The cleaning agent according to Claim 30, wherein the metal corrosion inhibitor is one selected from the group consisting of benzotriazole or derivatives thereof, benzimidazoles, mercaptoimidazole, mercaptothiazole, mercaptoethanol, mercaptoglycerol, cysteine, N-acetylcysteine and thioureas.

33. (New) The cleaning agent according to Claim 30, wherein the surfactant is one selected from the group consisting of nonionic surfactants having a polyoxyalkylene group in a molecule; anionic surfactants having a group selected from sulfonic acid group, carboxyl group, phosphonic acid group, sulfoxyl group and phosphonoxyl group in a molecule; amphoteric surfactants.